3.10 TRANSPORTATION

This section describes the existing transportation network serving the proposed KVWPP in Kittitas County near the City of Ellensburg. It also evaluates potential traffic volume and level-of-service impacts on the local transportation system, and identifies mitigation measures to limit those impacts. The analysis in this section is primarily based on information provided by the Applicant in the ASC (Sagebrush Power Partners LLC 2003a, Section 5.2). Where additional information has been used to evaluate the potential impacts associated with the proposal, that information has been referenced.

Existing state transportation plans and local comprehensive plans were reviewed to identify planned roadway improvements. Vehicle trip generation for the KVWPP was based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual, An Informational Report* (1997). Level-of-service (LOS) analyses were conducted consistent with methods presented in the *Highway Capacity Manual* (Transportation Research Board 2000).

3.10.1 Affected Environment

The project site is located in rural Kittitas County between the cities of Cle Elum and Ellensburg. The study area defined for this transportation analysis is bounded by SR 970 on the north, I-90 on the south and west, and US 97 on the east. The study area also includes roads maintained by Kittitas County, including Bettas Road and Hayward Road, as well as private roads. Most of the public roads in the region are paved county roads, with a few state routes traversing the area. The remaining public road system is composed of county roads that have bituminous pavement, gravel, or unimproved dirt. Figure 3.10-1 illustrates the principal transportation routes that would serve the site.

Existing Roadway Network

The Applicant has identified the most logical route to/from the Seattle area for the transport of materials that would be used during construction of the KVWPP. This route to the project site includes I-90, US 97, Bettas Road, and Hayward Road. In addition, several private roads provide access to private property in and around the project area, such as Elk Springs Road and Cricklewood Lane.

Interstate 90

I-90 is the major east-west freeway across the state of Washington. Near Cle Elum, I-90 has four lanes: two eastbound and two westbound. Each travel lane is 12 feet wide. Six-foot-wide paved shoulders exist on both sides of the highway. The posted speed limit is 70 mph. The Washington State Department of Transportation (WSDOT) maintains I-90.

Two truck weigh stations (one eastbound and one westbound) are located on I-90 approximately one-half mile west of the Bullfrog Road interchange at Cle Elum. Washington State Patrol operates both facilities, while WSDOT maintains access to and from the sites. In addition to the

truck weighing function, the westbound weigh station is used for checking and placing snow chains on trucks before they cross Snoqualmie Pass during winter months.

US 97

US 97 (north of I-90) is a two-lane, north-south roadway with 4- to 8-foot-wide asphalt shoulders between I-90 and SR 970. Its posted speed limit ranges from 40 to 65 mph. According to the WSDOT road classification system, the majority of US 97 within the project area is classified as a rural-principal arterial. The section of US 97 immediately north of I-90 at Ellensburg is classified as an urban-principal arterial (WSDOT 2003a). The section of US 97 south of Bettas Road passes through rolling terrain that causes trucks to slow down frequently. US 97 provides access to and across Blewett Pass in the north.

Kittitas County Roads

Kittitas County roads that would be used to access the KVWPP site include Bettas Road and Hayward Road, which branches off Bettas Road. These roads provide local access only. Bettas Road is a two-lane, north-south paved roadway that has posted speed limits of 35 mph and branches off US 97 approximately 10 miles north of the I-90 interchange. Hayward Road is a two-lane, north-south gravel road that branches off Bettas Road to the south. The southern portion of Hayward Road (approximate 3,000-foot segment between the North Branch Canal and SR 10) is unimproved and not accessible to emergency vehicles. Parking is not permitted along any of these roadways, with the exception of emergency parking.

Private Roads

Some of the rural residences in and around the project area are accessed by private roads that branch off US 97. Because these are private, dead-end roads whose primary function is to provide access to abutting properties, the number of road users and corresponding volume of traffic are assumed to be relatively small.

Elk Springs Road is a private road that extends along the top of the ridge where turbine string H is proposed. It is gated at US 97 and accessible only to property owners with a key. Elk Springs Road is used to access approximately 35 residences and recreational properties at dispersed locations along the ridge and on the forested slopes that lie north of proposed turbine strings G and H in an area referred to as “Section 35.” According to the Applicant, approximately five of the parcels in Section 35 have residences that are occupied on a full-time basis. Six of the parcels are used only on weekends, and nine are used occasionally (more than a few times a year, but less frequently than most weekends). The rest are used infrequently (a few times a year) (Sagebrush Power Partners LLC 2003a, Section 5.1.4.3.2).

Cricklewood Lane extends from US 97 into the canyon between the ridges where turbine strings I and J are proposed. Cricklewood Lane is not gated in the area from US 97 to the Bonneville transmission line corridor, but north of this area access is restricted by a locked gate. There are 11 residences along Cricklewood Lane.

Figure 3.10-1:

Traffic Patterns and Volumes

Table 3.10-1 shows the average daily traffic (ADT) volumes on roadways in the project area between 1997 and 2001. Volumes for 2001 are shown in Figure 3.10-1. These volumes are based on available traffic data from WSDOT. US 97 volumes vary from a predominantly urban setting near I-90 to a more rural setting in the vicinity of Bettas Road. Therefore, traffic was analyzed in two different sections where data were available from WSDOT. The first 2-mile section is immediately north of I-90 (referred to as US 97, north of I-90). The second 2-mile section is south of Bettas Road (referred to as US 97, south of Bettas Road).

Table 3.10-1: Average Daily Traffic Volumes and Estimated Percentage of Trucks

Roadway	1997 ADT	1998 ADT	1999 ADT	2000 ADT	2001 ADT	Estimated % Trucks
I-90 (west of US 97)	22,000	23,000	23,000[1]	22,000[1]	22,000	20
US 97 (north of I-90)[2]	2,500	2,600	2,800	2,800	2,800	N/A
US 97 (south of Bettas Rd.)	2,000	2,100	2,200	2,200	2,200	26
Bettas Road	N/A	N/A	43	36	26	N/A
Hayward Road	N/A	N/A	N/A	29	24[3]	N/A

Sources: WSDOT 2000, 2001; Spurlock, pers. comm., 2002.
N/A = Not available.
1 1999 and 2000 ADT for I-90 estimated.
2 The traffic count for this portion of US 97 was taken at MP 134.18; the road is classified as urban in this location (WSDOT 2003a).
3 2001 ADT for Hayward Road is estimated.

Roadway Limitations

The Kittitas County road network would provide the primary public routes for construction of the KVWPP. All new road construction in the county must be done in accordance with the current edition of WSDOT's *Standard Specifications for Road & Bridge Construction*. Kittitas County road standards state the minimum requirements for road construction in the county. According to RCW 46.44.041, the maximum legal load on state highways is 105,500 pounds. Kittitas County has adopted the state's schedules of permits and fees for overweight vehicles as set forth in RCW 46.44 for all county roads (Kittitas County 1997b).

On I-90, the route most likely to be used by construction vehicles, the Cle Elum River bridge at milepost (MP) 80.79 has a height restriction of 16 feet 6 inches in the center lane and 14 feet 8 inches to 15 feet in the westbound outside lane. In addition, there is a vertical height restriction on I-90 at Exit 62 approximately 8 miles east of Snoqualmie Pass. Loads over the legal height (14 feet) must exit at the eastbound ramp and reenter via the eastbound on-ramp (WSDOT 2003a).

Existing Roadway Levels-of-Service

LOS is a qualitative measure describing operational conditions in a traffic stream, and motorists' or passengers' perceptions of those conditions. It generally describes traffic conditions in terms

of speed and travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. There are six LOS classifications, each given a letter designation from A to F. LOS A represents the best operating conditions and LOS F represents the worst.

Kittitas County's LOS standards are contained in its Comprehensive Plan. Transportation GPO No. 4.26 addresses the issue of LOS. GPO 4.26 states, "Kittitas County shall utilize the HCM (Highway Capacity Manual) methodology to measure the effectiveness of the arterial system at arterial intersections by evaluating all arterial/arterial intersections (including state highways) to identify existing service levels and by developing a transportation model to evaluate the impacts of future land use alternatives on arterial or arterial intersections. Intersections that fall below level of service C in rural areas and D in urban areas shall be considered deficient" (Kittitas County 2002a).

Table 3.10-2 summarizes the existing roadway traffic conditions in the project vicinity and includes existing roadway classification, number of lanes, daily volume, design capacity, peak-hour volume, and LOS.

LOS was determined on the basis of the most current Highway Capacity Manual (Transportation Research Board 2000). Daily volumes (ADT) were used to analyze traffic conditions and determine the LOS along roadway segments. Intersection analyses were not performed because peak-hour turning movement counts were not collected. The daily volumes shown in Table 3.10-2 represent the estimated 2001 ADTs in both directions of travel. Available daily volumes were obtained from WSDOT and Kittitas County. These were used to estimate missing volumes and peak-hour volumes, which were assumed to be 10% of the daily volumes.

Table 3.10-2: 2001 Conditions of Affected Roadways

Roadway	Classification	No. of Lanes	Average Daily Volume	Hourly Design Capacity[1]	PM Peak-Hour Volume[2]	PM Peak-Hour LOS
I-90 (west of US 97)	Rural-Interstate	4	22,000	6,020	2,200	B
US 97 (north of I-90)	Urban-Principal Arterial	2	2,800	2,800	280	C
US 97 (south of Bettas Rd.)	Rural-Principal Arterial	2	2,200	2,800	220	C
Bettas Road	County Road	2	26	2,800	3	A
Hayward Road	County Road	2	24	2,800	3	A

Source: Sagebrush Power Partners LLC 2003a.

1 Maximum number of vehicles per hour in both directions for LOS E.

2 Peak-hour volumes estimated at 10% of ADT.

To determine the LOS for selected roadways in the study area, daily traffic capacity was determined by estimating capacities obtained from the Highway Capacity Manual. Daily traffic volumes were compared to these capacities to determine volume-to-capacity ratios. These ratios were used to calculate the existing LOS. The LOS definitions are presented in Appendix C. Included are definitions for freeways, urban streets, and two-lane rural highways. The freeway and two-lane rural highway LOS definitions are most applicable to the KVWPP.

The existing LOS for roadways surrounding the project site is LOS C or better, which represents generally smooth traffic conditions. Under these conditions, individual users feel unrestricted by the presence of others in the traffic stream.

Accident Rates

Accidents are generally expressed in terms of accident rate, where accident occurrence is indexed to the amount of traffic using a given roadway. For roadway segments, accident rates are computed as the number of accidents per million vehicle-miles (MVM) of travel. Table 3.10-3 shows an estimated number of accidents for selected roadways in the project area based on 1996 (the most recent year for which accident data are available) average daily traffic volumes and multi-year accident rates.

Table 3.10-3: Accident Rates and Numbers, 1996 and 2001

Roadway	Milepost	Length (mile)	Accident Rate (accidents/MVM)[1]	1996		2001	
				ADT	No. of Accidents	ADT	No. of Accidents[2]
I-90	106.06	3.28	0.80	20,000	26	22,000	29
US 97	135.38	14.31	0.60	2,250	9	2,800	11

Source: WSDOT 1996

1 1996 Multi-year accident rate. Rate is based on 1994-1996 data.

2 Estimated, based on 1996 accident rate.

The 1996 accident data indicate an average statewide accident rate of 1.48 accidents per MVM for the type of roadway corresponding to the rural portion of US 97 (rural-principal arterial). The average statewide accident rate is higher than the accident rate of these roads (0.60 accidents per MVM for US 97). Similarly, the statewide average accident rate for a rural interstate roadway is 0.86, which is higher than the accident rate for I-90 (0.80 accidents per MVM). WSDOT records indicate that two accidents have occurred at the intersection of US 97 and Bettas Road at MP 144.73 (a "T" intersection) in the last seven years (WSDOT 2003b).

Future Plans and Projects

Kittitas County Department of Public Works staff stated that there are currently no construction projects planned for county roads in the project area. WSDOT indicated that the following projects may affect transportation and/or operation of the proposed project (WSDOT 2003b):

- US 97: Ellensburg to Virden paving project (MP 137 at SR 10 - MP 149 at SR 970). Scheduled for spring of 2004. This project is within the boundaries of the KVWPP.
- I-90: Gold Creek to Easton Hill paving project (MP 55-MP 67). Scheduled for spring of 2004.

The paving project on I-90 between MP 55 and MP 67 is within the four-lane section of the interstate. Traffic control for this paving project would include lane closures restricting traffic to single-lane movements eastbound and westbound. The paving is expected to occur only during

daylight hours. Project-related heavy vehicles could potentially use these routes while they are under construction. See Section 3.14, Cumulative Impacts, for a discussion of potential cumulative traffic impacts from these and other projects.

Local Comprehensive Transportation Plans

There are currently no plans for major improvements to the transportation system in Kittitas County.

Pedestrian/Bicycle Facilities

Within Kittitas County, I-90 and US 97 are identified for bicycle use on the Washington Bicycle Map. Kittitas County Code 12.10 states that all roadway improvements shall include pedestrian access as part of the design unless otherwise approved by the County. There are currently no planned roadway improvements and no planned pedestrian or bicycle facilities on the roadways near the project site.

Public Transportation

Kittitas County is primarily a rural county where the need for public transportation in or near its towns is not a high priority. The cities of Cle Elum and Ellensburg in the project vicinity currently do not have public transit systems. However, there is an accessible/special needs transportation program provided by the Kittitas County Action Council for citizens. Greyhound bus service is the primary form of public transit between cities such as Cle Elum and Ellensburg.

Air Traffic

No regional or municipal airports are in the project vicinity. The closest airport is near Ellensburg, approximately 12 miles to the southeast. The Ellensburg airport does not have scheduled air service and is limited to private and charter plane service. Small planes may use private runways at ranches or farms in the project area; however, the frequency of this type of use is unknown. The closest private landing strip in the project vicinity is a little over 1 mile due east of proposed turbine string J and west of Green Canyon Road.

Rail Traffic

Burlington Northern operates an active main line between Auburn and the Tri-Cities over Stampede Pass. The main line passes through Ellensburg. Portions of the line were inactive until 1996, when the pass portion reopened to freight traffic. Approximately 4 to 10 trains traverse the route daily.

Waterborne Traffic

Over 100 miles southeast of the project site, the Ports of Pasco, Benton, and Kennewick are located on the Columbia River. Grain is the major commodity using barge transportation on this stretch of the river.

3.10.2 Impacts of Proposed Action

This section evaluates potential transportation impacts that could result from the proposed project. It summarizes vehicle trip generation associated with construction and operation of the KVWPP. Potential impacts on traffic volumes are evaluated for key roadways that would provide primary access to the project site. LOS analyses were conducted for 2004 (construction, operation, and maintenance impacts) and 2030 (operations and maintenance impacts).

Direct impacts would occur if predicted traffic levels exceed applicable LOS standards. Other types of direct transportation impacts include the potential for the project to exceed legal roadway load and weight limits, accident or navigational hazards (for both motorists and aviators), and degradation of roadway conditions. For the proposed project, the primary concern is the potential transportation-related impacts attributable to vehicle trips (both trucks and automobiles). These trips would be associated with construction, operations and maintenance, and decommissioning of the various project elements, including the wind turbines and meteorological towers, existing and new gravel access roads, additional power lines, and the proposed O&M facility and substations. Potential aviation hazards would be specifically associated with the proposed turbine and meteorological towers. Indirect impacts are not anticipated because the project is not expected to substantially induce regional growth to the extent that would result in significant changes to offsite traffic. Table 3.10-4 summarizes potential transportation impacts under the three project scenarios.

Table 3.10-4: Summary of Potential Transportation Impacts

	82 Turbines/3 MW (Lower End Scenario)	121 Turbines/1.5 MW (Middle Scenario)	150 Turbines/1.3 MW (Upper End Scenario)
Construction Impacts			
Construction trips	658 daily trips	622 daily trips	630 daily trips
Parking requirements	Same as middle scenario	Approx. 2 acres	Same as middle scenario
Hazardous materials transport	Same as middle scenario	Diesel fuel and gasoline required for mobile construction equipment	Same as middle scenario
Roadway limitations	Greater than middle scenario because of larger number of trucks	Trucks could exceed legal load and weight limits	Greater than middle scenario because of larger number of trucks
Roadway navigation hazards	Greater than middle scenario because of larger number of trucks	Increased risk of accidents	Greater than middle scenario because of larger number of trucks
Aviation hazards	Same as middle scenario	FAA determined no hazard to air navigation from construction equipment	Same as middle scenario
Operations and Maintenance Impacts			
Operational trips	Same as middle scenario	28 daily trips	40 daily trips
Parking requirements	Same as middle scenario	Up to approx. 20 spaces	Up to approx. 25 spaces
Hazardous materials transport	Same as middle scenario	No adverse effect	Same as middle scenario
Road limitations	Same as middle scenario	No effect anticipated	Same as middle scenario

Table 3.10-4: Continued

	82 Turbines/3 MW (Lower End Scenario)	121 Turbines/1.5 MW (Middle Scenario)	150 Turbines/1.3 MW (Upper End Scenario)
Operations and Maintenance Impacts cont.			
Road navigation hazards	Same as middle scenario	Potential for accidents at US 97/Bettas Road	Possibly greater risk because of slightly larger project-generated trips
Aviation hazards	Additional notice to FAA required due to different turbine configuration	FAA determined no hazard to air navigation from turbine towers	Additional notice to FAA required because of different turbine configuration
Road maintenance and public access requirements	26 miles (95 acres) of roadway footprint to maintain	26 miles (67 acres) of roadway footprint to maintain	Same as middle scenario
Tourism-induced traffic	Unknown	Unknown	Unknown
Decommissioning Impacts			
	Similar to those described for construction. However, assuming that roadways would remain in place, the resulting workforce and corresponding vehicle trips would be smaller.	Similar to those described for construction. However, assuming that roadways would remain in place, the resulting workforce and corresponding vehicle trips would be smaller.	Similar to those described for construction. However, assuming that roadways would remain in place, the resulting workforce and corresponding vehicle trips would be smaller.

Source: Sagebrush Power Partners LLC 2003a, c, f.

Construction Impacts

Traffic

Project construction would take approximately one year. It is anticipated that most of the employees would travel to the site from within a 75-mile radius.

The roadway network discussed above would be the primary roadways used by construction vehicles traveling to and from the project site. US 97, the primary access route to the site, would likely receive the greatest impact from construction vehicles and workers. It is anticipated that the majority of the construction workforce traffic would originate in Ellensburg and Yakima. Even if the majority of employees came from outside Kittitas and Yakima counties (as is assumed in the socioeconomic analysis), these workers would probably temporarily relocate to the project vicinity, and therefore would travel on the same roads as local residents. Employees coming from Ellensburg would travel north on US 97 to the junction with Bettas Road, where workers would disperse to the various construction locations at the project site. Employees from Yakima would most likely travel north on I-82, then west on I-90 to US 97, and continue northbound on US 97 to Bettas Road. These are the shortest and most direct routes from the major urban areas within a 75-mile radius.

The wind turbines, towers, transformers, and other large equipment would be transported to the site using a semi-truck and lowboy transporter designed for heavy loads (i.e., multiple axles). The trucks would deliver the equipment to the project site. During the peak construction month, there would be an onsite workforce of about 160 workers. The average workforce over the entire construction period would be about 75 workers.

Estimated construction vehicle trips generated under the three project scenarios are presented in Table 3.10-5.

Table 3.10-5: Construction Trip Generation

	82 Turbines/3 MW (Lower End Scenario)	121 Turbines/1.5 MW (Middle Scenario)	150 Turbines/1.3 MW (Upper End Scenario)
Employee Traffic			
Daily trips[1]	320	320	320
PM peak-hour trips	160	160	160
Light Duty Delivery Trucks			
Daily trips	40	40	40
PM peak-hour trips	20	20	20
Heavy Duty Truck Trips[2]			
Total truck trips	26,730	23,633	24,238
Daily truck trips[3]	298	262	270
PM peak-hour trips	149	131	135
Total Construction Trips			
Daily trips	658	622	630
PM peak-hour trips	329	311	315

Source: Sagebrush Power Partners LLC 2003a, f.

1 Assumes no worker carpooling.

2 Assumes offsite import of gravel from a location(s) south of the immediate project area.

3 Assumes 180 workdays over a nine-month construction period at 20 workdays per month.

During the peak construction period, employees would generate approximately 320 daily trips, 160 of which would occur during the evening peak hour. (The trip estimate does not include any reduction from carpooling.) In addition to worker traffic, there would be an estimated 20 light duty delivery trucks during the peak of the construction period, resulting in 40 daily trips. Therefore, the total number of vehicles during the construction peak would be 180 (160 vehicles for worker traffic and 20 vehicles for light duty delivery). This number would be the same under all three project scenarios.

Construction-related traffic would consist of deliveries of project equipment and construction materials (such as concrete and steel) by truck. Truck deliveries are anticipated to occur between 8 a.m. and 4:30 p.m. on weekdays. These truck deliveries would include:

- Major equipment (e.g., tower sections, nacelles, blades);
- Gravel for site access roads, O&M facility area, and substation;
- Water trucks to wet the road during compaction and for dust control;
- Construction equipment delivery and pickup;
- Concrete and reinforcing steel;
- Mechanical equipment;
- Electrical equipment and material (transformers, cable, etc.);
- Miscellaneous steel, roofing, and siding;
- Construction consumables; and
- Contractor mobilization and demobilization.

For purposes of estimating trip generation, the most conservative scenario assumes construction of 82 wind turbines (the lower end scenario). The reason for this assumption is that for wind turbines larger than 1.5 MW in size, more gravel trucks would be required to construct 34-foot-wide roads to allow for the safe passage of larger cranes. Under this scenario, approximately 26,700 heavy duty truck deliveries are expected during the construction period. (This assumes that gravel for site construction must be brought to the project from an offsite source in or around Ellensburg or from another location(s) south of the project area.) Assuming 180 work days (nine months at 20 workdays per month), this would result in an average of 149 trucks per day or 298 daily truck trips. Although the construction period is expected to last for approximately one year, a nine-month (180-day) construction schedule was assumed for purposes of evaluating the most conservative construction traffic scenario.

Table 3.10-6 summarizes future 2004 PM peak-hour traffic and LOS during the construction period for the lower end scenario (the scenario that would involve the greatest number of trips). The projected number of construction trips was assigned to each roadway shown in Table 3.10-4. Because these trips would be distributed onto multiple roadways during project construction (i.e., 149 heavy duty truck trips would typically not occur along Bettas Road during a PM peak-hour period), Table 3.10-4 provides worst-case estimates of LOS on any given roadway.

Table 3.10-6: Total PM Peak Hour and LOS Construction Impacts (Lower End Scenario)

Roadway	No. of Lanes	2004 Base ADT	2004 PM Peak[1]	Employee Truck Traffic	Construction Truck Traffic		Total PM Peak	LOS
					Light Duty	Heavy Duty		
I-90 (west of US 97)	4	22,660	1,283	0	20	149	1,452	B
US 97 (north of I-90)	2	2,884	297	160	20	149	626	D
US 97 (south of Bettas Rd.)	2	2,266	233	160	20	149	562	C
Bettas Road	2	27	3	160	20	149	332	B
Hayward Road	2	25	3	160	20	149	332	B

Source: Sagebrush Power Partners LLC 2003a, f.
[1] Directional volumes.

The construction LOS during the PM peak hour with employee traffic and delivery traffic would be LOS D on US 97 north of I-90. The first segment of US 97 immediately north of I-90 (between MP 134.00 and 134.87) is classified as an urban-principal arterial, whereas the portion

north of MP 134.87 is classified as a rural-principal arterial. According to WSDOT, the portion of US 97 north of I-90 most likely to experience LOS D conditions would be expected at or around the four-way stop of US 97 and Dolarway Road in the City of Ellensburg at MP 134.14 (Holmstrom, pers. comm., 2003). Therefore, for the urban portion of US 97 north of I-90 the project's construction-generated traffic would not exceed the county standard of LOS D for urban areas. Construction traffic impacts would be mitigated with appropriate traffic-control procedures approved by WSDOT, as presented in Section 3.10.4.

Parking

During construction, parking would be located at the O&M facility and along the site access roads. The O&M facility would also serve as a construction staging area. Parking along turbine string roads would be primarily for those employees working on foundations, electrical infrastructure, and turbines. Vehicles would park in areas that are already temporarily or permanently disturbed for other construction purposes. No additional ground disturbance would occur solely for parking needs.

It is anticipated that roughly half of all employee vehicles would be parked at the O&M facility and the other half would be dispersed across the various turbine strings. Assuming a peak workforce of 160 people, the worst-case scenario (assuming no carpooling) would require approximately 2 acres for parking. This parking area requirement would be the same under the three project scenarios.

Hazardous Materials Transport

Diesel fuel and gasoline are the only potentially hazardous materials that would be used in significant quantities during project construction (approximately 25,000 gallons under each project scenario). The EPC contractor would use fuel trucks to refill construction vehicles and equipment onsite. The fuel trucks would be properly licensed and would incorporate features in equipment and operation such as automatic shut-off devices to prevent accidental spills. Measures to prevent and contain accidental spills resulting from fuel transportation are discussed in Section 3.4, Health and Safety.

Roadway Limitations

The movement and transport of wind turbine components along state highways is necessary because there is no source for these components close to the project. The required materials and equipment must be shipped into the region from a larger metropolitan area such as Seattle. The wind turbine blades are manufactured as single units and cannot be divided. The proposed route for these superloads is along I-90 and US 97, both of which are state-maintained highways.

Some of the trucks that would deliver construction equipment and materials to the project site would have a gross vehicle weight of up to 105,500 pounds. This would exceed the WSDOT legal load limit. Trucks in excess of legal load limits could degrade the condition of existing roadways. This potential impact would be greatest for the lower end scenario because it would require the greatest number of heavy duty truck trips.

RCW 46.44.090 allows special permits to be issued for vehicles exceeding the state's maximum size, weight, and load limits. Because KVWPP construction vehicles may exceed this weight limit, a special permit in accordance with RCW 46.44.090 would be required. For example, WSDOT allows superloads with a special superload permit. A superload is a vehicle or combination with a nondivisible load having a gross weight exceeding 200,000 pounds and/or a total width or height exceeding 16 feet. A permit for these superloads must be submitted in writing, along with an explanation of why the move or transport is necessary, why the load cannot be divided into smaller loads, and a proposed route that is known to be adequate to accommodate this superload.

The Cle Elum River bridge is height-restricted only in the westbound direction. Therefore, this bridge would not restrict loaded trucks carrying oversize equipment traveling eastbound on I-90 to the project site.

Roadway Navigation Hazards

WSDOT staff visited the project site in the spring of 2003. On the basis of that visit, WSDOT gave preliminary approval to two project access points at private approaches on the east side of US 97: one adjacent to Elk Springs Road at MP 144.56 and one at MP 145.9. The access point at MP 144.56 would be temporary and removed after construction. WSDOT recommended access at MP 145.9 after reviewing project plans and visiting the project site. The access point at MP 145.9 has good sight distance and a widened shoulder that would aid in delivery of oversized equipment and construction materials (WSDOT 2003b). A third access point off US 97 would be at MP 144.73 at the intersection of US 97 and Bettas Road. The sight distance at the public road intersection with Bettas Road and at the private access connections exceeds the minimum sight distance requirements set forth in the WSDOT Design Manual, Chapter 9 (WSDOT 2003c).

Construction vehicles would not use private roadways used by residents who live in or visit the project area, such as Elk Springs Road and Cricklewood Lane. However, given the potential volume of truck trips generated during construction, the additional vehicular and construction traffic attributable to the project could temporarily increase the risk of accidents in the project area. The risk of accidents would be greatest along routes where construction vehicles would share the roadway with other vehicles, such as along Bettas Road or US 97. A Transportation Management Plan would be submitted to EFSEC for review and approval before construction, and that plan would include measures to minimize impacts of construction-related traffic (see Section 3.10.4, Mitigation Measures).

The Cle Elum and Ellensburg School Districts indicate that their buses use US 97 and some stop on the route where shoulders are provided. Given that construction-related traffic is not anticipated to increase total truck volume along the highways by more than 15% over the current level and this increase would be for a short period, it is not expected to cause problems for school bus service in the area.

Aviation Hazards

Temporary construction equipment such as cranes and derricks that may be used during construction of the proposed towers could pose a hazard to aviation safety during the construction period. The FAA has reviewed and approved use of proposed construction equipment at the site and has issued "Determinations of No Hazard to Air Navigation" for the project. FAA permits are discussed in further detail below.

Operations and Maintenance Impacts

Traffic

The project would operate continuously (24 hours per day, 7 days per week) using an automated system. It would employ an estimated 14 to 20 full-time workers, depending on the selected project scenario. The operations crew would normally work 8-hour days Monday through Friday, with one person working half days on the weekends. The maximum number of vehicle trips associated with workers commuting to and from the O&M facility on paved state and county roads would be 40 during a 24-hour period under the upper end scenario. Traffic between the O&M facility and the individual turbines on the new and upgraded private gravel roads would be minimal during operations. This source of traffic would consist of weekly or less frequent trips to turbines for maintenance and repair (Sagebrush Power Partners LLC 2003a, Section 3.2.4).

Future traffic volumes and LOS on public roads during the operations and maintenance phase of the project were estimated for two buildout years: 2004 (start of operations) and 2030. Future year 2030 volumes were estimated using a 2% growth factor. This growth factor is considered reasonable because of the area's rural nature and is based on growth factors developed for other projects in Kittitas County.

Table 3.10-7 presents estimated current and future traffic volumes and LOS during the operations and maintenance phase of the project. As shown in Table 3.10-7, all roadways would operate at LOS C or better during evening peak conditions. According to the Applicant, the LOS of unsignalized intersections in the area would probably continue to operate at acceptable levels in the future.

Table 3.10-7: Existing and Future Daily Peak-Hour Traffic Volumes and LOS with and without Project (Upper End Scenario)

	2001 Existing PM Peak		2004 PM Peak without Project		2004 PM Peak with Project		2030 PM Peak without Project (Horizon Year)		2030 PM Peak with Project (Horizon Year)	
	Traffic	LOS	Traffic	LOS	Traffic	LOS	Traffic	LOS	Traffic	LOS
I-90[1] (west of US 97)	1,210	B	1,283	B	1,303	B	1,912	C	1,932	C
US 97 (north of I-90)	280	C	297	C	317	C	442	C	462	C
US 97 (south Bettas Road)	220	C	233	C	253	C	348	C	368	C
Bettas Road	3	A	3	A	23	A	5	A	25	A
Hayward Road	3	A	3	A	23	A	4	A	24	A

1 Directional volumes

The total projected number of operations and maintenance trips were assigned to each roadway shown in Table 3.10-7. Because these trips would be distributed onto multiple roadways during project operations, Table 3.10-7 provides conservative estimates of LOS.

Parking

During the operational phase, employees would park at the O&M facility parking lot. With an anticipated operations workforce of 20 people, plus occasional visitor and delivery vehicles, no more than 25 vehicles are expected to be parked at the facility at any one time under the upper end scenario. A visitor kiosk is also planned at the O&M facility, which would provide tourists a safe place to view and learn about the wind turbines. Parking requirements for this visitor kiosk would be accommodated by parking spaces at the O&M facility. However, as described below under Tourism-Induced Traffic, the number of vehicle trips, both buses and private cars, that would be associated with the KVWPP as a tourist attraction is unknown. Therefore, the proposed O&M facility parking lot may not be sufficient to accommodate future parking needs of both project employees and potential tourists. Mitigation measures for this potential impact are recommended in Section 3.10.4.

Hazardous Materials Transport

No substantial quantities of industrial materials would be brought onto or removed from the project site during project operations. The only materials that would be brought onto the site would be those related to maintenance and/or replacement of project facilities (e.g., nacelle or turbine components, electrical equipment). Hazardous materials transported to the site include minimal amounts of lubricating oils, hydraulic fluids, and mineral oil (see Section 3.5, Energy and Natural Resources). The largest quantities of hazardous materials used during project operations would occur under the upper end scenario because of the larger number of turbines. Waste fluids would need to be changed infrequently (generally less than once per year and sometimes only once every five years), and therefore would not result in a safety risk associated with hazardous materials transport.

Roadway Limitations

Vehicles used during operations and maintenance of the proposed project would primarily be from employees commuting to and from the site and are not expected to exceed state or county legal roadway load limits. Therefore, these trips would not contribute to degradation of roadway conditions.

Road Navigation Hazards

During the EIS scoping process, concerns were raised about the project's effects on the ability of motorists traveling northbound on US 97 to turn left onto Bettas Road. This intersection would be the entry to the proposed O&M facility as well as to a public viewing area. According to WSDOT, the intersection has good sight distance on US 97, but does not have turn lanes (WSDOT 2003b). Projected traffic volumes during project operations could result in increases in

the number of accidents at this intersection. This potential impact would be greatest under the upper end scenario because it would involve the greatest number of trips.

Another concern raised during the scoping period is the safety risk to motorists of ice from the turbine blades falling onto nearby public and private roadways during winter months. Measures to reduce this risk are addressed in Section 3.4, Health and Safety.

Aviation Hazards

The FAA must be notified of construction or alteration of a structure that may affect the National Airspace System (NAS) as required under 14 CFR part 77. A Notice of Proposed Construction or Alteration Form (FAA Form 7460-1) must be completed. Any temporary or permanent structure, including all appurtenances, that exceeds an overall height of 200 feet above ground should be marked and/or lighted. FAA recommendations on marking and/or lighting structures can vary depending on terrain features, weather patterns, geographic location, and in the case of wind turbines, the number of structures and overall layout of design (FAA 2000).

The FAA has reviewed plans for the proposed project (under the middle scenario) to determine if it has the potential to interfere with local air traffic operations and issued "Determinations of No Hazard to Air Navigation" (numbers 2002-ANM-1017-OE through 2002-ANM-1206-OE) on August 21, 2002. The FAA issued separate no hazard determinations for each proposed wind power and meteorological tower using two types of determinations: one type concluded that the tower would not require lighting, the second type concluded that it did. A copy of each type of no hazard determination (for proposed turbines G1 and G2) is included in Appendix C (Transportation).

The FAA determinations were based on the number, sizes, and dimensions of turbines proposed for the middle scenario (i.e., 1.5-MW turbines). According to the FAA permits, "any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA." Because the lower and upper end scenarios would operate using different numbers and sizes of equipment, the FAA would be notified of these changes (see Section 3.10.4, Mitigation Measures).

Road Maintenance and Public Access

The Applicant would construct a road system on the project site, with site access roads from the turbine locations to US 97, Bettas Road, or Hayward Road. The Applicant would be responsible for maintenance of turbine string access roads, access ways, and other roads built to construct and operate the project.

The only multipurpose rights-of-way (ROWs) envisioned for the project involves a 1-mile section of the existing Bonneville ROW between Hayward Road and the proposed Bonneville substation and turbine string E (see Figure 2-1). This ROW is currently a dirt road and is not heavily used by Bonneville. The Applicant's plans for upgrading this ROW are discussed in Section 3.10.4, Mitigation Measures.

During the EIS scoping process, members of the public requested that the EIS describe future uses of project maintenance roads and whether they could be used as residential access routes through leased property, as well as address the project's impacts on roads currently closed for the winter. According to the Applicant, turbine maintenance roads would be available for the use of the fee owners of the affected parcels. The Applicant would also provide a master key to local emergency responders to allow access to all project maintenance roads (Sagebrush Power Partners LLC 2003c).

The northern potion of Hayward Road is the only public road that the Applicant proposes to use for project construction and operations that is currently closed for the winter. The Applicant has proposed measures to upgrade and maintain this roadway through all phases of the project (see Section 3.10.4, Mitigation Measures). Potential upgrades to the southern portion of Hayward Road are being discussed in negotiations with Kittitas County Fire District No. 1 (see Section 3.13, Public Services and Utilities, for further discussion).

There would be no public access to project facilities on privately owned land during construction, operations and maintenance, or decommissioning of the project. Any access provisions for project facilities located on land owned by Washington DNR would be arranged in coordination with DNR, in conjunction with the Applicant's land lease, and according to agency guidelines. Appropriate measures to protect public safety would be incorporated in any access provisions for DNR lands in the project site.

Tourism-Induced Traffic

During the EIS scoping process, members of the public requested that the traffic impacts associated with tourism generated by project operations be addressed as part of the EIS analysis. Tourists who visit the project area could affect local traffic patterns and road safety. The Kittitas County Department of Public Works specifically requested that the EIS address the impacts of tourism on Bettas and Hayward roads.

As is occurring in southeast Washington at the wind turbine development near Walla Walla, visits to the project area by tourists can be expected. Examples of potential environmental effects attributable to increased tourism include degradation of the level-of-service on project area roadways such as US 97 and Bettas Road from increased automobile and bus trips and increased demand for parking at the O&M facility/public viewing area. However, the number of vehicle trips, both buses and private cars, that would be associated with the KVWPP as a tourist attraction is unknown. Similarly, it is unknown to what extent visitors attracted to the project area would represent new tourists that otherwise would not have visited the area. Therefore, without specific data, the environmental effects of tourism are considered an issue of uncertainty that has yet to be resolved. The Applicant proposes to construct an information kiosk and public viewing area near the proposed O&M facility off Bettas Road (see Section 3.10.4, Mitigation Measures). This kiosk would minimize potential tourist-generated traffic impacts on state and county roads.

Decommissioning Impacts

Impacts from decommissioning activities would be similar to those for construction. However, assuming that the roadways would remain in place, heavy vehicle trips would primarily consist of trucks carrying wind turbines and transformers and the resulting workforce and vehicle trips would be smaller. Mitigation at the time of decommissioning would be implemented and would likely be similar to that recommended for construction.

3.10.3 Impacts of No Action Alternative

Under the No Action Alternative, the project would not be constructed or operated, and the environmental impacts described in this section would not occur. The No Action Alternative assumes that future development would comply with existing zoning requirements for the project area, which is zoned Agriculture-20 and Forest and Range.

Background growth projections (without the project) are based on past county and state growth and take into account any known large capital projects. A 2% growth factor was assumed in establishing impacts on future background levels of traffic.

Local policies are intended to maintain public road service at or above an accepted level of service determined by the county. Roadways that would experience heavy truck traffic can be assessed on an individual basis by the county during the project. All of the roadways in the study boundaries currently provide LOS C or better.

Table 3.10-8 describes the existing and future daily peak-hour traffic volumes and LOSs without any project traffic impacts. It is estimated that during the peak hour in 2004, all roadways in the project vicinity would function at LOS C or better without the project.

Table 3.10-8: Existing, Future Daily, and Peak-Hour Traffic Volumes and LOS without Project

Roadway	No. of Lanes	Daily		Estimated Directional Peak Hour without Project			
		2001	2004	2001	LOS	2004	LOS
I-90 (west of US 97)	4	22,000	22,660	1,210	B	1,283	B
US 97 (north of I-90)	2	2,800	2,884	280	C	297	C
US 97 (south of Bettas Rd.)	2	2,200	2,266	220	C	233	C
Bettas Road	2	26	27	3	A	3	A
Hayward Road	2	24	25	3	A	3	A

Source: WSDOT 2001; City of Cle Elum 2001

If the proposed project is not constructed, it is likely that the region's need for power would be addressed by developing a gas-fired combustion turbine. Because constructing and operating a gas-fired combustion turbine is a predictable consequence of not building the project, it is considered a predictable outcome of the No Action Alternative (Bonneville et al. 2002). Constructing a power generation facility other than the proposed project could have

transportation impacts. The intensity and significance of transportation impacts would depend on the site-specific design and location of the generation facility.

3.10.4 Mitigation Measures

Mitigation Measures Proposed by the Applicant

Construction Traffic Control

The following mitigation measures are proposed to reduce the impact of project construction on roadway traffic in the region:

- The Applicant would prepare a Transportation Management Plan (TMP) that would be reviewed and approved by WSDOT and Kittitas County. The TMP would direct and obligate the contractor to implement procedures that would minimize traffic impacts;
- The TMP would include coordination between project-related construction traffic and WSDOT planned construction projects;
- Any oversize or overweight vehicles would comply with applicable state and county requirements, as permitted by WSDOT and Kittitas County.
- The Applicant would provide notice to landowners when construction takes place to help minimize access disruptions;
- The Applicant would provide proper road signs and warnings of "Equipment on Road," "Truck Access," or "Road Crossings";
- When slow or oversized wide loads are in transit to and from the site, advance signs and traffic diversion equipment would be used to improve traffic safety. Pilot cars would be used as WSDOT codes dictate depending on load size and weight. Permits would be obtained for these oversized or overweight vehicles as required by WSDOT and Kittitas County;
- The Applicant would construct necessary site access roads and entrance driveways that would be able to service truck movements of legal weight;
- The Applicant would encourage carpooling for the construction workforce to reduce traffic volume;
- In consultation with Kittitas County, the Applicant would provide detour plans and warning signs in advance of any traffic disturbances;
- The Applicant would employ flaggers as necessary to direct traffic when large equipment is exiting or entering public roads to minimize risk of accidents;
- One travel lane would be maintained at all times.

Hazardous Materials Transport

- Transportation of hazardous materials would be conducted in a manner that protects human health and the environment and is in accordance with applicable federal and WSDOT requirements.

Access Road Construction

- The access road from US 97 would be constructed with slopes and culverts designed according to WSDOT and Washington State access management standards under Title 468 WAC and Chapter 47.50 RCW. Access from county roads (Bettas or Hayward) would also be constructed with the appropriate slopes and culverts in accordance with Kittitas County standards.

Roadway Maintenance

- The Applicant proposes to upgrade the northern portion of Hayward Road prior to construction to allow passage of heavy equipment and trucks and to restore this portion of Hayward Road to a condition equal to or better than its present condition after construction is completed.
- The Applicant would consult with the Kittitas County Department of Public Works to determine the specific requirements for any improvement and restoration to Hayward Road (and any other county roads used by the project).
- The Applicant proposes to take responsibility for ongoing maintenance to the northern portion of Hayward Road that is necessitated by the project's operation. Assuming the County chooses to keep Hayward Road closed for the winter, the Applicant would coordinate with the County to keep non-project vehicles off this road during the closure period.
- The Applicant plans to submit an Application for Proposed Use of ROW to Bonneville for joint use of the 1-mile section of ROW between Hayward Road and the proposed Bonneville substation and turbine string E. With Bonneville approval, the Applicant proposes to upgrade this section of ROW from dirt to gravel surface and would assume responsibility for maintenance of this section of ROW.

Tourism-Induced Traffic

- The Applicant proposes to construct an information kiosk and public viewing area near the proposed O&M facility off Bettas Road. Signs would be provided to direct tourists to this site (see Section 2.2.3, Facilities). This measure would minimize tourist-generated traffic impacts on county roadways.

Additional Recommended Mitigation Measures

Construction Traffic Control

- The Applicant should consult and coordinate with WSDOT and Kittitas County to identify additional temporary measures that could be implemented to improve LOS along US 97 north during the construction period.

Parking

To ensure that adequate parking is provided to accommodate both project employees at the O&M facility and tourists attracted to the project area, the following mitigation measure is recommended:

- The Applicant should monitor the volume of tourists visiting the proposed viewing area to determine if overflow parking is required. If additional parking is needed, the Applicant could identify and create an adjacent overflow parking area. The specific location of an overflow parking area should be sited so that tourist traffic does not conflict with employee access into and out of the O&M facility and no additional environmental impacts are caused.

Traffic Safety

In the absence of projected increased traffic volumes at the intersection of US 97 and Bettas Road, WSDOT recommends the following mitigation measure to improve traffic safety at this intersection during project operations (WSDOT 2003b):

- WSDOT would monitor the incidence of traffic accidents at the intersection of US 97 and Bettas Road. If, within a five-year time period, WSDOT determines that channelization improvements at the intersection of US 97/Bettas Road are necessary to reduce accidents caused by additional turning traffic, the Applicant should be responsible for all costs associated with the safety improvement. The safety improvement would be limited to a northbound left-turn lane, a southbound right-turn lane, or both. The time period for monitoring would begin at the time of development approval.

Aviation Safety

To ensure that the project would not create hazards to aviation under any of the project scenarios, the following mitigation measure is recommended:

- If the Applicant's final proposal differs from the proposal submitted to, reviewed, and approved by the FAA in terms of number, siting, or size of proposed turbines, the Applicant should notify the FAA of these changes and secure any additional "Determinations of No Hazard to Air Navigation," as warranted.

3.10.5 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts are associated with the transportation element of the proposed project. The Applicant has proposed several mitigation measures to minimize traffic impacts along all project area roadways.